

ABSTRACT OF THE DISCLOSURE

A method is provided to deposit niobium monoxide gates. An elemental metal target, or a composite niobium monoxide target is provided within a sputtering chamber. A substrate with gate dielectric, for example silicon dioxide or a high-k gate dielectric, is provided in the sputtering chamber. The sputtering power and oxygen partial pressure within the chamber is set to deposit a film comprising niobium monoxide, without excess amounts of elemental niobium, NbO_2 insulator, or Nb_2O_5 insulator. The deposition method may be incorporated into a standard CMOS fabrication process, or a replacement gate CMOS process.